

## CLAIMS

1. A method for handing over a mobile station connection, comprising:
  - receiving one or more downlink signal quality measurements associated with one or more neighboring base stations;
  - determining a target base station based on the one or more signal quality measurements;
  - determining a desired antenna beam from plural antenna beams at the target base station for communicating with the mobile station; and
  - establishing a handover connection between the target base station and the mobile station using the desired antenna beam at the target base station.
2. The method in claim 1, further comprising:
  - determining a location of the mobile station, and
  - determining the desired antenna beam using the determined location.
3. The method in claim 1, wherein the signal quality measurements are for a signal broadcast over an entire cell, further comprising:
  - establishing a radio link between the target base station and the mobile station using the broadcast signal, and thereafter, determining the desired antenna beam at the target base station, and
  - reconfiguring the radio link to use the desired antenna beam.
4. The method in claim 3, wherein the radio link is reconfigured from a first phase reference associated with the broadcast signal to a second phase reference associated with the desired antenna beam.
5. The method in claim 1, the further comprising:
  - requesting from the target base station one or more uplink signal quality measurements associated with the mobile station for multiple antenna beams.

6. The method in claim 5, further comprising:  
determining which antenna beam at the target base station is desired for the mobile station connection using the one or more uplink signal quality measurements, and  
setting up a radio link between the desired antenna beam and the mobile station.
7. The method in claim 1, wherein the desired antenna beam covers an area where the mobile station is currently located or where the mobile station is predicted to be located.
8. The method in claim 1, wherein the desired antenna beam covers an area closest to where the mobile station is currently located or where the mobile station is predicted to be located.
9. The method in claim 1, wherein the handover is a soft or softer handover.
10. The method in claim 1, wherein the handover is a hard handover.
11. The method in claim 1, wherein the target base station includes one or more first antennas for transmitting a first type of signal using a wide antenna beam, the signal quality of which is detected by mobile stations for purposes of providing downlink signal quality messages and one or more second antennas for transmitting a second type of signal using an antenna beam narrower than the wide antenna beam.
12. A radio network controller for use in establishing a handover connection between a mobile station and a target radio base station, comprising:  
a memory for storing one or more downlink signal quality measurements associated with one or more neighboring base stations, and  
processing circuitry configured to perform the following:  
determine the target base station based on the one or more

signal quality measurements stored in the memory;

determine a desired antenna beam from plural antenna beams at the target base station for communicating with the mobile station; and

direct establishment of a handover connection between the target base station and the mobile station using the desired antenna beam at the target base station.

13. The radio network controller in claim 12, wherein the processing circuitry is further configured to:

determine a location of the mobile station based on measurement made by the target base station, and

determine the desired antenna beam using the determined location.

14. The radio network controller in claim 12, wherein the signal quality measurements are for a cell-wide signal that includes multiple antenna beams, the processing circuitry is further configured to:

establish a radio link between the target base station and the mobile station using the cell-wide signal, and thereafter, determine the desired antenna beam at the target base station, and

reconfigure the radio link to use the desired antenna beam.

15. The radio network controller in claim 14, wherein the radio link is reconfigured from a first phase reference associated with the cell-wide signal to a second phase reference associated with the desired antenna beam.

16. The radio network controller in claim 12, wherein the processing circuitry is further configured to:

request from the target base station one or more uplink signal quality measurements associated with the mobile station for multiple antenna beams.

17. The radio network controller in claim 16, wherein the processing circuitry is further configured to:

determine which antenna beam at the target base station is desired for the mobile station connection based on the one or more uplink signal quality measurements associated with the mobile station received from the target base station, and

set up a radio link between the desired antenna beam and the mobile station.

18. The radio network controller in claim 12, wherein the desired antenna beam covers an area where the mobile station is currently located or where the mobile station is predicted to be located.

19. The radio network controller in claim 12, wherein the desired antenna beam covers an area closest to where the mobile station is currently located or where the mobile station is predicted to be located.

20. The radio network controller in claim 12, wherein the handover is a soft or softer handover.

21. The radio network controller in claim 12, wherein the handover is a hard handover.

22. The radio network controller in claim 12, wherein the target base station includes one or more first antennas for transmitting a first type of signal using a wide antenna beam, the signal quality of which is detected by mobile stations for purposes of providing downlink signal quality messages and one or more second antennas for transmitting a second type of signal using an antenna beam narrower than the wide antenna beam.

23. A communications system incorporating the radio network controller in claim 11.

24. Apparatus for handing over a mobile station connection, comprising:  
means for receiving one or more downlink signal quality measurements associated with one or more neighboring base stations;

means for determining a target base station based on the one or more signal quality measurements;

means for determining a desired antenna beam from plural antenna beams at the target base station for communicating with the mobile station; and

means for establishing a handover connection between the target base station and the mobile station using the desired antenna beam at the target base station.

25. The apparatus in claim 24, further comprising:  
means for determining a location of the mobile station, and  
means for determining the desired antenna beam using the determined location.

26. The apparatus in claim 24, wherein the signal quality measurements are for a signal broadcast over an entire cell, further comprising:

means for establishing a radio link between the target base station and the mobile station using the broadcast signal, and thereafter, determining the desired antenna beam at the target base station, and

means for reconfiguring the radio link to use the desired antenna beam.

27. The apparatus in claim 26, wherein the means for reconfiguring reconfigures the radio link from a first phase reference associated with the broadcast signal to a second phase reference associated with the desired antenna beam.

28. The apparatus in claim 24, the further comprising:  
means for requesting from the target base station one or more uplink signal quality measurements associated with the mobile station for multiple antenna beams.

29. The apparatus in claim 28, further comprising:  
means for determining which antenna beam at the target base station is desired for the mobile station connection using the one or more uplink signal quality measurements, and  
means for setting up a radio link between the desired antenna beam and the mobile station.

30. The apparatus in claim 24, wherein the desired antenna beam covers an area where the mobile station is currently located or where the mobile station is predicted to be located.

31. The apparatus in claim 24, wherein the desired antenna beam covers an area closest to where the mobile station is currently located or where the mobile station is predicted to be located.

32. The apparatus in claim 24, wherein the handover is a soft or softer handover.

33. The apparatus in claim 24, wherein the handover is a hard handover.

34. The apparatus in claim 24, wherein the target base station includes one or more first antennas for transmitting a first type of signal using a wide antenna beam, the signal quality of which is detected by mobile stations for purposes of providing downlink signal quality messages and one or more second antennas for transmitting a second type of signal using an antenna beam narrower than the wide antenna beam.